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AN IMPROVED ASTIGMATIC CHART.

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Dispensary, University Hospital.*

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## AN IMPROVED ASTIGMATIC CHART.

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SOME time since I made a series of experiments with the different methods of eliciting the subjective symptoms of astigmatism, with the idea of obtaining a test which should manifest itself to the comprehension of the patient naturally and quickly, and enable the physician to determine without unnecessary delay the principal meridians.

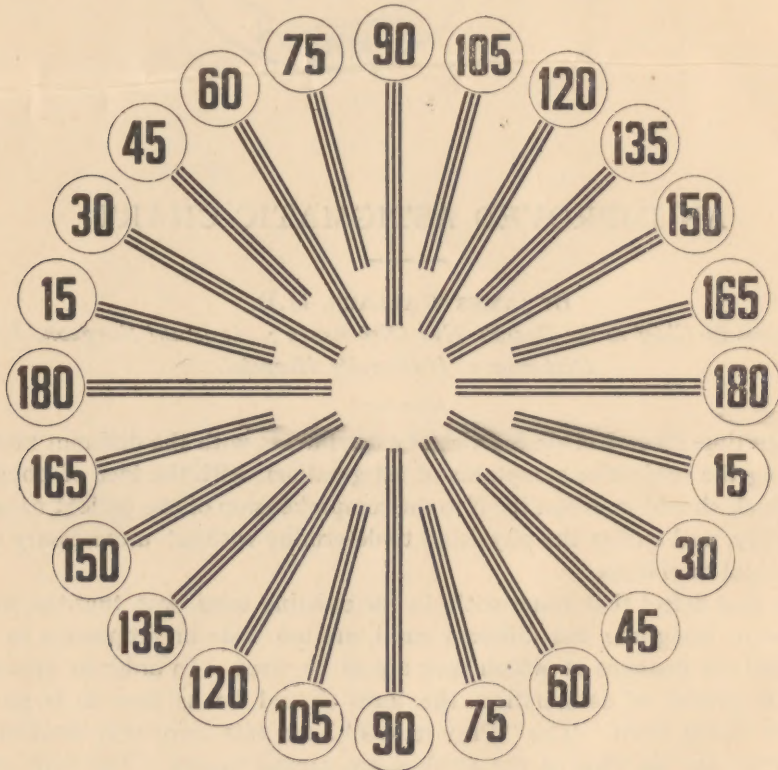
The first defect that I met with, in the existing tests, was, that the strokes employed to designate the different radii, are too wide in proportion to their length and the distance at which they are to be used. In order to appreciate the lower grades of astigmatism the lines should be as fine as is possible with the visual limit. The "Pray letters" have this error very marked, and are of little use, as some of the strokes are almost square. The dials of Dr. Green, while constituting a very excellent test for astigmatism, do not manifest the lower grades readily, because the lines in these dials are the same width as test letters for 30 feet, and as the range employed in testing vision varies from 15 to 20 feet, they require a considerable degree of astigmatism to render them of value.

It seems to be only a fair assumption that the same limit of vision, accepted as normal in constructing test letters, namely, an angle of  $1'$ , should be utilized in the astigmatic tests. This has been done in the card now presented: the lines on the smaller card are in width equal to an angle of  $1'$  with a radius of 20 feet. As we do not always have normal sharpness of sight, more particularly when the degree of astigmatism is considerable, it is necessary to have radii of larger size to compensate for diminution in vision, this has been accomplished



by printing on the reverse side of the card the same diagram enlarged one and a third times. Another difficulty with other cards is, that they only represent intervals of  $30^\circ$ ; it is obvious that the principal meridians may lie in between, and while some of the cards rotate so as to compensate for the missing radii, it is more laborious and not so accurate to obtain the end by this means, as by having the intervals of  $15^\circ$  each to correspond with the principal divisions of the trial frame; some difficulty is caused here by concentrating 24 radii instead of 12.

The card is constructed as follows :—



The card contains twenty-four radii each composed of three lines and two spaces equal in width, forming together the dimensions of the standard letter for 20 feet. These radii converge to a point at which they are separated from each other by an interval equal to their own width; here the alternate radii stop, the others being continued until they reach the same limit. This produces some difference in the length of the lines; on the smaller card the shorter lines are four-and-one-half inches in length, the larger ones six inches; these sizes are two and three times those of Green's lines, and increase the contrast between the length and the width of the lines, which is the important principle in astigmatic tests.

The different degrees of the circle are marked by figures, whose size is

more than twice that of a standard test object for the same distance, so that a person whose vision is cut down to  $\frac{20}{XL}$  still reads the numbers on the lines for 20 feet. To avoid confusion in designating the lines by the numbers, a circle has been placed around each number, which enables the observer to connect it more certainly with its respective line. A source of error in using this test arises from the habit some people have of holding the head inclined to one side, fifteen degrees or more may not be perceived by the physician if seated at the patient's side. In practice this card has been very satisfactory to myself, an astigmatism of 0.25 dioptic being easily detected by it.









